

## Unit 9 Review: *Democritus, Dalton & Thomson*

Name: \_\_\_\_\_

1. How would Thomson explain what he found to Democritus?

**Thomson would describe how he found the electron, that electrons are negatively charged particles found inside atoms, and that Dalton's idea that atoms were indestructible is incorrect.**

2. Explain how Thomson came up with the "Plum Pudding" or "Fruit Jello" model.

**<http://youtu.be/dehxVQAUqBs>**

3. What did Rutherford find that no one else had ever found?
4. Explain the experiment that lead Rutherford to his discovery.

**<http://youtu.be/bIVI-rMLm54>**

5. Determine which person did or said each of the following. Write Democritus, Dalton, Thompson, Rutherford, Bohr, or Schrodinger on each blank.

Thompson He discovered the electron.

Dalton Atoms combine in distinct ratios or proportions

Bohr The electrons travel around the nucleus in well defined paths like planets around the sun.

Rutherford The atom is made up mostly of space

Rutherford The nucleus consists of a dense center.

Thompson He was the first to show that the atom could be divided into smaller parts (subatomic particles)

6. Write neutron, proton, or electron on each blank to match with the statement.

electron 1. This particle is the lightest of all the particles.

neutron 2. This subatomic particle has no charge

neutron 3. In an isotope the number of this subatomic particle changes

electron 4. When an atom becomes ionized, what is lost or gained?

proton 5. In an ion, atom, or isotope, this subatomic particle has the same number.

electron 6. In a neutral atom, the number of protons equals the number of what?

neutron 7. The mass of the proton is almost equal to the mass of which subatomic particle?

electron 8. In a positive ion, the atom has lost which type of particle?

electron 9. The charge on an atom is determine by the number of valence \_\_\_\_\_.

7. Determine the number of valence electrons for each atom below:

\_\_\_\_\_ 1. He \_\_\_\_\_ 2. P \_\_\_\_\_  
\_\_\_\_\_ 3. Li \_\_\_\_\_ 4. B \_\_\_\_\_  
\_\_\_\_\_ 5.  $\text{Cl}^{-1}$  \_\_\_\_\_ 6.  $\text{K}^{+1}$  \_\_\_\_\_

8. Determine which of the following is a non-metal (N) or metal (M) or Semi-metal (S).

\_\_\_\_\_ 1. Na \_\_\_\_\_ M \_\_\_\_\_ 7. He \_\_\_\_\_ ???  
\_\_\_\_\_ 2. Cl \_\_\_\_\_ N \_\_\_\_\_ 8. P \_\_\_\_\_ N  
\_\_\_\_\_ 3. Au \_\_\_\_\_ M \_\_\_\_\_ 9. O \_\_\_\_\_ N

9. Calculate the number of neutrons in the following:

\_\_\_\_\_ 1. Na \_\_\_\_\_ 12 \_\_\_\_\_ 2. Be \_\_\_\_\_ 5 \_\_\_\_\_  
\_\_\_\_\_ 3. O \_\_\_\_\_ 8 \_\_\_\_\_ 4.  $^{15}\text{N}$  \_\_\_\_\_ 8 \_\_\_\_\_  
\_\_\_\_\_ 5.  $^{37}\text{Cl}$  \_\_\_\_\_ 20 \_\_\_\_\_ 6.  $\text{K}^{+1}$  \_\_\_\_\_ 20 \_\_\_\_\_

10. Determine which atom is larger. Circle the larger atom.

\_\_\_\_\_ 1. Li or K \_\_\_\_\_ 2. F or O  
\_\_\_\_\_ 3. Mg or K \_\_\_\_\_ 4. Cl or Br  
\_\_\_\_\_ 5. Se or Kr

11. Determine which atom is more reactive. Circle the more reactive atom.

\_\_\_\_\_ 1. Li or Na \_\_\_\_\_ 2. Br or At  
\_\_\_\_\_ 3. Mg or Sr \_\_\_\_\_ 4. Cs or Li  
\_\_\_\_\_ 5. O or S

12. Determine the most likely charge on each atom. Write the atom with its charge designation (+3, +2, +1, 0, -1, -2, -3) on the blank.

\_\_\_\_\_ 1. Na \_\_\_\_\_ +1 \_\_\_\_\_ 2. Cl \_\_\_\_\_ -1 \_\_\_\_\_  
\_\_\_\_\_ 3. Ca \_\_\_\_\_ +2 \_\_\_\_\_ 4. Se \_\_\_\_\_ -2 \_\_\_\_\_  
\_\_\_\_\_ 5. B \_\_\_\_\_ +3 \_\_\_\_\_ 6. F \_\_\_\_\_ -1 \_\_\_\_\_  
\_\_\_\_\_ 7. He \_\_\_\_\_ +2 \_\_\_\_\_

13. Determine which element has the following properties.

    P     1. The 3rd energy level contains 5 valence electrons

    Li     2. The 2nd energy level contains the valence electrons. When charged the atom has a most likely charge of +1

    Mg     3. The 3rd energy level contains only 2 electrons in the s orbital

    F     4. This element is in family VII and period 2.

    N     5. The 2nd energy level contains 3 electrons in the p orbitals

O. Fill in the blanks for the following:

1. **Al**

<u>    </u> a.	atomic number	<u>    13    </u>
<u>    </u> b.	atomic mass	<u>    26.98    </u>
<u>    </u> c.	number of protons	<u>    13    </u>
<u>    </u> d.	number of neutrons	<u>    14    </u>
<u>    </u> e.	number of electrons	<u>    13    </u>

2. **<sup>37</sup>Cl**

<u>    </u> a.	atomic number	<u>    17    </u>
<u>    </u> b.	atomic mass	<u>            </u>
<u>    </u> c.	number of protons	<u>    17    </u>
<u>    </u> d.	number of neutrons	<u>    20    </u>
<u>    </u> e.	number of electrons	<u>    17    </u>

3. **Na<sup>+1</sup>**

<u>    </u> a.	atomic number	<u>    11    </u>
<u>    </u> b.	atomic mass	<u>    22.9898    </u>
<u>    </u> c.	number of protons	<u>    11    </u>
<u>    </u> d.	number of neutrons	<u>    12    </u>
<u>    </u> e.	number of electrons	<u>    10    </u>